Radiation

Radiation

- Radiation is a form of energy that is present all around us.
- Different types of radiation exist, some of which have more energy than others.
- Amounts of radiation released into the environment are measured in units called curies. However, the dose of radiation that a person receives is measured in units called rem.

Radiation Exposure

- People are exposed to small amounts of radiation every day, both from natural sources (such as elements in the soil or cosmic rays from the sun) and man-made sources. Man-made sources include some electronic equipment (such as microwave ovens and television sets) and medical sources (such as x-rays, certain diagnostic tests, and treatments).
- The amount of radiation from natural or man-made sources to which people are exposed is usually small; a radiation emergency (such as a nuclear power plant accident or a terrorist event) could expose people to small or large doses of radiation, depending on the situation.
- Scientists estimate that the average person in the United States receives a dose of about one-third of a rem per year. About 80 percent of human exposure comes from natural sources, and the remaining 20 percent comes from man-made radiation sources – mainly medical x-rays.
- Contamination refers to particles of radioactive material that are deposited anywhere they are not supposed to be, such as on an object or on a person's skin.

People and Radiation Exposure

- Radiation can affect the body in a number of ways, and the adverse health effects of exposure may not be apparent for many years.

- These adverse health effects can range from mild effects such as skin reddening to serious effects such as cancer and death, depending on the amount of radiation absorbed by the body (the dose), the type of radiation, the route of exposure, and the length of time a person was exposed.

- Exposure to very large doses of radiation may cause death within a few days or months.

- Exposure to lower doses of radiation may lead to an increased risk of developing cancer or other adverse health effects later in life.

Terrorist Events Involving Radiation

- Possible terrorist events could involve introducing radioactive material into the food or water supply, using explosives (like dynamite) to scatter radioactive materials (called a “dirty bomb”), bombing or destroying a nuclear facility, or exploding a small nuclear device. (See Section 10.4)

- Although introducing radioactive material into the food or water supply most likely would cause great concern or fear, it probably would not cause much contamination or increase the danger of adverse health effects.

- Although a dirty bomb could cause serious injuries from the explosion, it most likely would not have enough radioactive material in a form that would cause serious radiation sickness among large numbers of people. However, people who were exposed to radiation scattered by the bomb could have a greater risk of developing cancer later in life, depending on their dose.

- A meltdown or explosion at a nuclear facility could cause a large amount of radioactive material to be released. People at the facility probably would be contaminated with radioactive material and possibly be injured if there was an explosion. Those people receiving large doses might develop acute radiation syndrome. People in the surrounding area could be exposed or contaminated.

- Clearly, an exploded nuclear device could result in a lot of property damage. People would be killed or injured from the blast and might be contaminated by radioactive material. Many people could have symptoms of acute radiation syndrome. After a nuclear explosion, radioactive fallout would extend over a large region far from the point of impact, potentially increasing people's risk of developing cancer over time.

Preparations for a Radiation Emergency

- Your community should have a plan in place for dealing with a radiation emergency. Check with community leaders to learn more about the plan and possible evacuation routes.

- Check with your child's school, the nursing home of a family member, and your employer to see what their plans are for dealing with a radiation emergency.

- Develop a Family Disaster Plan and Supply Kit (See Sections 2.2 – 2.4)

Protection During a Radiation Emergency

- After a release of radioactive materials, local authorities will monitor the levels of radiation and determine what protective actions to take.

- The most appropriate action will depend on the situation. Tune to the local emergency response network or news station for information and instructions during any emergency.

- If a radiation emergency involves the release of large amounts of radioactive materials, you may be advised to "shelter in place," which means to stay in your home or office; or you may be advised to move to another location.

- If you are advised to shelter in place, you should do the following:

  - Close and lock all doors and windows.

  - Turn off fans, air conditioners, and forced-air heating units that bring in fresh air from the outside. Only use units to recirculate air that is already in the building.

  - Close fireplace dampers.

  - If possible, bring pets inside.

  - Move to an inner room or basement.

  - Keep your radio tuned to the emergency response network or local news to find out what else you need to do.

  - If you are advised to evacuate, follow the directions that your local officials provide. Leave the area as quickly and orderly as possible.

Condensed from a paper developed by the Centers for Disease Control and Prevention entitled "Frequently Asked Questions about a Radiation Emergency"